

What is claimed is:

1. A method for identifying a polypeptide,
comprising:

5 (a) simultaneously determining the mass of a
subset of parent polypeptides from a population of
polypeptides and the mass of fragments of said subset of
parent polypeptides;

(b) comparing said determined masses to a
annotated polypeptide index; and

10 (c) identifying one or more polypeptides of said
annotated polypeptide index having said determined masses.

2. The method of claim 1, further comprising:

15 (d) determining one or more additional
characteristics associated with one or more of said parent
polypeptides;

(e) comparing said characteristics determined in
step (a) and step (d) to said annotated polypeptide index;
and

20 (f) optionally repeating steps (d) and (e) one or
more times, wherein a set of characteristics is determined
that identifies a parent polypeptide as a single polypeptide
in said annotated polypeptide index.

3. The method of claim 1, further comprising quantitating the amount of said identified polypeptide in a sample containing said polypeptide.

4. The method of claim 2, wherein a set of
5 characteristics is determined that identifies two or more parent polypeptides as single polypeptides in said annotated polypeptide index.

5. The method of claim 4, wherein a set of characteristics is determined that identifies each of said
10 parent polypeptides in said subset of parent polypeptides.

6. The method of claim 1, wherein said fragment mass is determined by mass spectrometry in the absence of ion selection for producing fragment ions.

7. The method of claim 1, wherein said fragment
15 mass is determined at an accuracy in ppm of greater than 1 ppm.

8. The method of claim 1, wherein said fragment mass is determined at an accuracy in ppm of 2.5 ppm or greater ppm.

9. The method of claim 1, wherein said fragment
20 mass is determined at an accuracy in ppm of 5 ppm or greater ppm.

10. The method of claim 1, wherein said fragment
25 mass is determined at an accuracy in ppm of 10 ppm or greater ppm.

11. The method of claim 1, wherein said fragment mass is determined at an accuracy in ppm of 100 ppm or greater ppm.

12. The method of claim 13, wherein said
5 characteristics are selected from the group consisting of polypeptide mass, amino acid composition, pI, and order of elution on a chromatographic medium.

13. A method for identifying a polypeptide, comprising:

10 (a) simultaneously determining the mass of a subset of parent polypeptides from a population of polypeptides and the mass of fragments of said subset of parent polypeptides;

15 (b) comparing said determined masses to an annotated polypeptide index;

(c) identifying one or more polypeptides of said annotated polypeptide index having said determined masses; and

20 (d) quantitating the amount of said identified polypeptide in a sample containing said polypeptide.

14. The method of claim 13, further comprising:

(e) determining one or more additional characteristics associated with one or more of said parent polypeptides;

5 (f) comparing said characteristics determined in step (a) and step (e) to said annotated polypeptide index; and

(g) optionally repeating steps (e) and (f) one or more times, wherein a set of characteristics is determined
10 that identifies a parent polypeptide as a single polypeptide in said annotated polypeptide index.

15 15. The method of claim 14, wherein a set of characteristics is determined that identifies two or more parent polypeptides as single polypeptides in said annotated polypeptide index.

16. The method of claim 15, wherein a set of characteristics is determined that identifies each of said parent polypeptides in said subset of parent polypeptides.

20 17. The method of claim 13, wherein said fragment mass is determined by mass spectrometry in the absence of ion selection for producing fragment ions.

18. The method of claim 13, wherein said fragment mass is determined at an accuracy in ppm of greater than 1 ppm.

19. The method of claim 13, wherein said fragment mass is determined at an accuracy in ppm of 2.5 ppm or greater ppm.

20. The method of claim 13, wherein said fragment
5 mass is determined at an accuracy in ppm of 5 ppm or greater ppm.

21. The method of claim 13, wherein said fragment mass is determined at an accuracy in ppm of 10 ppm or greater ppm.

10 22. The method of claim 13, wherein said fragment mass is determined at an accuracy in ppm of 100 ppm or greater ppm.

23. The method of claim 13, wherein said
characteristics are selected from the group consisting of
15 polypeptide mass, amino acid composition, pI, and order of elution on a chromatographic medium.

24. A method for identifying a polypeptide,
comprising

(a) determining two or more characteristics
20 associated with said polypeptide, or a fragment thereof, one of said characteristics being mass of a fragment of said polypeptide, said fragment mass being determined by mass spectrometry in the absence of ion selection for producing fragment ions;

(b) comparing said characteristics associated with said polypeptide to a polypeptide identification index; and

(c) identifying one or more polypeptides in said
5 polypeptide identification index having said characteristics.

25. The method of claim 24, further comprising

(d) determining one or more additional characteristics associated with said polypeptide; and

10 (e) comparing said characteristics determined in step (a) and step (d) to said polypeptide identification index.

26. The method of claim 24, further comprising quantitating the amount of said identified polypeptide in a
15 sample containing said polypeptide.

27. The method of claim 24, wherein said polypeptide identification index is an annotated peptide index.

28. The method of claim 24, wherein said fragment
20 mass is determined at an accuracy in ppm of 1 ppm or greater ppm.

29. The method of claim 24, wherein said fragment mass is determined at an accuracy in ppm of 2.5 ppm or greater ppm.

30. The method of claim 24, wherein said fragment mass is determined at an accuracy in ppm of 5 ppm or greater ppm.

31. The method of claim 24, wherein said fragment
5 mass is determined at an accuracy in ppm of 10 ppm or greater ppm.

32. The method of claim 24, wherein said fragment mass is determined at an accuracy in ppm of 100 ppm or greater ppm.

10 33. The method of claim 24, wherein three or more characteristics of said polypeptide are determined.

34. The method of claim 24, wherein four or more characteristics of said polypeptide are determined.

15 35. The method of claim 24, wherein five or more characteristics of said polypeptide are determined.

36. The method of claim 24, wherein said characteristics are selected from the group consisting of polypeptide mass, amino acid composition, pI, and order of elution on a chromatographic medium.

37. A method for identifying a polypeptide,
comprising

(a) determining two or more characteristics
associated with said polypeptide, or a fragment thereof, one
5 of said characteristics being mass of a fragment of said
polypeptide, said fragment mass being determined by mass
spectrometry at an accuracy in ppm of greater than 2.5 ppm;

(b) comparing said characteristics associated
with said polypeptide to a polypeptide identification index;
10 and

(c) identifying one or more polypeptides in said
polypeptide identification index having said
characteristics.

38. The method of claim 37, further comprising

15 (d) determining one or more additional
characteristics associated with said polypeptide; and

(e) comparing said characteristics determined in
step (a) and step (d) to said polypeptide identification
index.

20 39. The method of claim 37, further comprising
quantitating the amount of said identified polypeptide in a
sample containing said polypeptide.

40. The method of claim 37, wherein said polypeptide identification index is an annotated peptide index.

41. The method of claim 37, wherein said fragment
5 mass is determined at an accuracy in ppm of 5 ppm or greater ppm.

42. The method of claim 37, wherein said fragment mass is determined at an accuracy in ppm of 10 ppm or greater ppm.

10 43. The method of claim 37, wherein said fragment mass is determined at an accuracy in ppm of 100 ppm or greater ppm.

44. The method of claim 37, wherein three or more characteristics of said polypeptide are determined.

15 45. The method of claim 37, wherein four or more characteristics of said polypeptide are determined.

46. The method of claim 37, wherein five or more characteristics of said polypeptide are determined.

20 47. The method of claim 37, wherein said characteristics are selected from the group consisting of polypeptide mass, amino acid composition, pI, and order of elution on a chromatographic medium.